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ABSTRACT BOOK

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5-HIAA levels. Following these tests, rats were anesthetized and their serum CORT levels were analyzed.

The differences between the groups were analysed by Kruskal-Wallis and Friedman tests. Changes in behavioural parameters, before and after the anxiety state were analyzed by Wilcoxon test. 5-HIAA and CORT parameters were analyzed by ANOVA and T tests.

Anxiety that is induced by elevated T maze and cat odor in young rats reflected as high CORT levels compared to control groups, implying that effective level of anxiety had been really induced. In aged rats, CORT and 5-HIAA levels did not change implying that either 1) anxiety affected the young rats more than the aged ones or 2) the age related physiological decreases in old ages compared to younger ages. The 5-HIAA level differences in the young rats group were in parallel with behavioural parameters. However, there were no differences in 5-HIAA levels in the aged group. Taken together, these results may imply that 5-HIAA measurements is a reliable tool for showing the effects of anxiety in young rats whereas it is not so in the aged rats.

Key words: learning-memory, anxiety, age, 5-Hydroxyindoleaceticacid, corticosterone

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Relationship of BOLD response with steady state evoked potentials

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The joint use of the EEG as an electrophysiological technique with a high temporal resolution and neuroimaging techniques such as fMRI and PET that reflect neural activity with a high spatial resolution will help to understand better the neural activity patterns observed. Within this framework, a correct modeling of the neurovascular coupling is a very important for revealing the relationship between the BOLD response and functional neural activity patterns.

Tonic neural discharges can be expected to generate increases in BOLD response, whereas it is not yet systematically investigated how the metabolic activity changes during regular oscillations in the EEG bands such as alpha and gamma. The analysis of changes in the BOLD response under the conditions which synchronized neural activity generated will improve the understanding about neurovascular coupling.

It is well known that the brain stimulation in any sensory modality with stimuli at high presentation frequencies generates regular oscillations in the EEG at the stimulation frequency and its harmonics. The steady-state evoked potentials obtained with this type of stimulation show increased amplitudes at stimulus presentation frequencies close to the peaks in the EEG spectrum (10, 20, 40 and 80 Hz).

In this study, changes in the relationship between SSVEP (Steady State Visual Evoked Potentials) and BOLD responses during visual stimulation have been systematically studied with 24 stimulus presentation rates (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 20, 22, 24, 28, 32, 36, 40, 44 Hz) between 1–44 Hz. The diffuse light modulated by computer generated square waves were used for stimulation. The photic stimulation was applied using LEDs coupled to fiber bundle which transferred the light into the magnet and EEG room. The BOLD measurements were conducted with 1.5 Tesla Siemens Symphony MRI System. A single shot T2* weighted gradient echo planar imaging sequence was used for BOLD measurements. Twenty slices of 64x64 were acquired with a slice thickness 3.5 mm positioned through the visual cortex. EEG has been recorded from 32 channel with Brain Amp MR+ amplifier. The signals were analog filtered between 0.1–250 Hz and digitized at 1000 samples/sec.

The analysis of the relationship between BOLD responses and SSVEPs power showed similar local maxima within the alpha range (around 8 and 10 Hz stimulation frequencies) and in the gamma range (around 40 Hz). But, in the beta band and below the alpha range, power of the EEG signals and BOLD percentage changes seem to be uncorrelated. Such differences in SSVEP and BOLD responses to different stimulus frequencies suggest that energetic cost of electrical oscillations differ across frequency ranges.

At the current stage of the study, we can conclude that the investigation of the influence of neurons synchronized with stimulus frequency on hemodynamic response provides further understanding about the relationship between electrophysiology and hemodynamics of neuronal activity.

Keywords: Electroencephalogram, Functional Magnetic Resonance Imaging, Event-Related Oscillations, Steady-state Evoked Potentials, BOLD, SSVEP

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The effect of familiar environment on scopolamine-induced convulsions in fasted mice after food intake

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Mice treated with scopolamine after fasting for two days develop convulsions soon after allowed to eat ad lib. Animals also develop convulsions after deprived of food for shorter periods. Neuroadaptive changes during food deprivation have been suggested to underlie the occurrence of convulsions. It has been shown that due to an increase in the anxiety level, latency in food intake increases and amount of food consumption decreases in animals reered in novel environment. Thus, food intake in unfamiliar environment may contribute to the development of convulsions in fasted animals. In the present study, the effects of food intake in familiar and novel environments on convulsions were investigated in 48 h fasted mice. Albino Balb/C mice housed 3 per cage were deprived of food for 48 h. On the day of testing, half of the animals was kept in the housing room (familiar environment) and the other half was transferred to the testing room (novel environment). The animals were treated i.p. with saline (control) or 3 mg/kg scopolamine. After treatments, animals in the familiar environment remained in their home cages whereas animals in the novel environment were placed in an observation cage (3 animals per cage). Twenty min later, they were given food pellets and allowed to eat ad lib. All animals were observed for 30 min for the incidence and onset of convulsions. Seizure activity was quantified by staging 1-5 (Enginar et al., Neuropharmacology 44:199, 2003). Incidence of convulsions was expressed as the percentage of animals displaying forelimb clonus with rearing (either stage 3, 4 or 5). Fisher's Exact test and Student's t-test were used to evaluate the incidence and onset of convulsions, respectively. The body weights of the mice fell to approximately 80-82% of the initial body weights after fasting for 48 h. Scopolamine treatment caused convulsions both in animals fed in observation cages (78%; $p<0.01$) and in home cages (34%; $p>0.05$). Eating in familiar environment increased latency in onset of convulsions (5.5±1.1 to 18.0±7.5 min; $p<0.05$). Present results show that the incidence of convulsions decreases and the onset of convulsions delays when food is given to fasted animals in familiar environment. However, the significant incidence of forelimb clonus (stage 2) in home cage animals indicates that familiar environment could not prevent the occurrence of convulsions in a significant manner.

Key words: food deprivation, familiar environment, scopolamine, convulsions, mice

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Cpp effect in adult rats which had free access to oral nicotine since adolescence

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Although the harmful effects of smoking are known, the average age for initiating smoking is decreasing. Nicotine is known to be the main addictive substance in tobacco and therefore is used in animal models to study smoking addiction. The addictive aspects of nicotine can be evaluated regarding reward, conditioning, deprivation, tolerance etc. Individual differences in